

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Southwest Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Royal Mouldings Limited
US 11 and Bear Creek Rd., Smyth County, Virginia
Permit No. SWRO10284

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Royal Mouldings Limited has applied for reissuance of its Title V Operating Permit for its wood and plastic moulding manufacturing facility in Smyth County. The Department has reviewed the application and prepared a Title V Operating Permit.

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FACILITY INFORMATION

Permittee

Royal Mouldings Limited
P.O. Box 610
Marion, VA 24354-0610

Facility

Royal Mouldings Limited
Intersection of US 11 and Bear Creek Rd.
Smyth County, Virginia

AFS ID No. 51-173-00002

SOURCE DESCRIPTION

SIC Code: 3089 and 2431 – Polyvinyl chloride (PVC), styrene and cellular polyvinyl chloride (CPVC) flakes are mixed, colored and extruded in the Main Plant. The extruded mouldings may then be routed to hotstamping, mylar lamination and cutting operations. Wood mouldings (SIC 2431) are also routed to the latter three operations. Final mixing and application of paint to both the plastic and wood mouldings take place in the Prefinish area. Six primary finishing lines include a catalytic drying oven for each, with one exhaust stack for the coating application and one stack for the drying oven. Five coating lines (6A, 8, 9, 10 and 12) have been removed. A total of 24 PVC extruders have been added since the original Title V permit was issued June 7, 1999. The addition of two water-based coating lines (now solvent-based per NSR amendment), the addition of two roll applicator print machines, increases in throughput limits for coating lines 1 and 2, and the addition of polyvinyl chloride and polystyrene throughput limits for the total extrusion process, serve as the basis for significant modifications of the Title V permit dated April 9, 2007 and August 23, 2005, as reissued December 20, 2004. All of the ovens are fired by natural gas, with some heat also provided by electric coils. Coating systems consist of either fan or curtain coaters. Fan coaters have limited atomization, are usually used with high solids coatings, and may be controlled by filters to control particulate emissions. Finally, a printing process applies ink to plastic mouldings for a wood grain appearance. These inks are applied by moving green rolls, which are produced onsite by a molding, curing and glazing process.

The facility is a Title V major source of Volatile Organic Compounds (VOC). This source is located in an attainment area for all pollutants, and is a PSD minor source. The facility was previously permitted under minor NSR permits dated March 4, 1980, and February 21, 1997 (as amended March 12, 2002 and March 21, 2003). It is currently permitted under minor NSR permit dated February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

COMPLIANCE STATUS

The last onsite inspection on June 10, 2009, indicated that no problems were noted at the facility in regard to all process operations. Reviews of required Title V submittals such as semiannual monitoring reports and annual compliance certifications also indicate compliance.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following :

Emission Unit ID	Emission Unit Description & Construction Date (If known)	Capacity/ Size	Pollution Control Device (PCD)	PCD ID	Stack ID	Pollutant Controlled
Coating Lines 1 and 2		Subject to 9 VAC 5 Chapter 50 (New or Modified)				
CL 1 & CL 2	Two Allied Metals fan coater systems (1995)	2.25 gal/hr each	Fiberglass filters	CL 1-2 filters	CLS 1-2	PM (Particulate matter)
Coating Lines 3 Through 6		Subject to 9 VAC 5 Chapter 40 (Existing)				
CL 3-CL 6	Coating lines 3-6 (1968)	27.1 gal/hr (total)	Fiberglass filters	CL 3-6 Filters	CLS 3-6	PM
Storage Silos 1-4		Subject to 9 VAC 5 Chapter 40 (Existing)				
SS 1-4	Four PVC silos (1968)	5.35 tons/hr for all six silos	One baghouse serving 4 silos		SSS 1-4	PM
Storage Silos 5-6		Subject to 9 VAC 5 Chapter 50 (New or Modified)				
SS 5-6	Two styrene silos (2001)	5.35 tons/hr for all six silos	A baghouse on each silo		SSS 5-6	PM
PVC Extruders		Subject to 9 VAC 5 Chapter 50 (New) and Chapter 40 (Existing)				
PVC-EX	PVC extruders (1968, 1998, 2000 and 2005)	7.772 tons/hr (total)			EXS 1-8	
Styrene Extruders		Subject to 9 VAC 5 Chapter 40 (Existing)				
STY-EX	Styrene extruders (1968)	1.702 tons/hr (total)			EXS 1-8	

Emission Unit ID	Emission Unit Description & Construction Date (If known)	Capacity/ Size	Pollution Control Device (PCD)	PCD ID	Stack ID	Pollutant Controlled
Solvent-Based Coating Line #7 Subject to 9 VAC 5 Chapter 50 (New)						
CL7	Spray booth & 1.44 MMBtu/hr natural gas-fired oven (2005)	5.5 gal/hr	Fiberglass filters	CL7 filter	WB7-SB & Oven	PM
Solvent-Based Coating Line #8 Subject to 9 VAC 5 Chapter 50 (New)						
CL8	Spray booth & 1.44 MMBtu/hr natural gas-fired oven (2005)	5.5 gal/hr	Fiberglass filters	CL8 filter	WB8-SB & Oven	PM
Mylar Adhesive Process Subject to 9 VAC 5 Chapter 40 (Existing)						
MYL-1	The Mylar Adhesive Process has been shut down permanently	1395.6 linear ft/hr				
Catalytic Ovens 1 and 2 Subject to 9 VAC 5 Chapter 50 (New or Modified)						
CO1 & CO2	Combination electric/nat. gas ovens as primary, gas-fired Weather-Rite furnaces are alternate sources. (1994)	1.8 MMBtu/hr each oven & 3.0 MMBtu/hr per furnace.			CO-Stacks 1 & 2	
Catalytic Ovens 3 and 4 Subject to 9 VAC 5 Chapter 50 (New or Modified)						
CO3 & CO4	Combination electric/nat. gas (1994)	4.0 MMBtu/hr each			CO-Stacks 3 & 4	
Catalytic Ovens 5 and 6 Subject to 9 VAC 5 Chapter 50 (New or Modified)						
CO5 & CO6	Combination electric/nat. gas (1994)	2.8 MMBtu/hr each			CO-Stacks 5 & 6	
Glaze Line Subject to 9 VAC 5 Chapter 50 (New or Modified)						
GL	Glaze line has been shut down permanently	3.8 gal/day	CL filter		GLS	
Roll Applicator Print Machines Subject to 9 VAC 5 Chapter 40 (Existing)						
Roll 1-10	Ten (10) roll applicator print machines inking mouldings from bath containers (1968)	28,246 linear ft/hr				

Emission Unit ID	Emission Unit Description & Construction Date (If known)	Capacity/ Size	Pollution Control Device (PCD)	PCD ID	Stack ID	Pollutant Controlled
Roll Applicator Print Machines		Subject to 9 VAC 5 Chapter 50 (New)				
Roll 11-12	2 roll applicator print machines inking mouldings from bath containers (2004)	5,649 linear ft/hr				
Green Roll Processing		Subject to 9 VAC 5 Chapter 40 (Existing)				
GRP-1	Molding, curing and glazing of Green Rolls (printing rolls) involving 3 electric vacuum drying ovens and 2 hoods (1968)	1 roll/hr			GRS 1	

EMISSIONS INVENTORY

Emissions are included below from the 2008 Emission Statement submitted to the Virginia Department of Environmental Quality for criteria pollutants.

Actual Emissions

	Criteria Pollutant Emission in Tons/Year				
Emission Unit	VOC	CO	SO ₂	PM ₁₀	NO _x
Facility	108.4	3.2	0	8.6	3.8

2008 Facility Hazardous Air Pollutant Emissions

Pollutant	Hazardous Air Pollutant Emission in Tons/Year
Total HAPs	3.13

EMISSION UNIT APPLICABLE REQUIREMENTS – Coating Lines 1 thru 6 (CL 1 - 6), Solvent-Based Coating Lines 7 and 8 (CL 7 & 8) and Roll Applicator Print Machines 1 – 12 (Roll 1 – 12)

Limitations

Facility limitations from the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

3. Particulate emissions from the Coating Lines 1 and 2, and the solvent-based Coating Lines 7 and 8, shall be controlled by fiberglass filters or equivalent. The fiberglass filters shall be provided with adequate access for inspection and shall be in operation when the spray booths are operating.

(9 VAC 5-50-260, 9 VAC 5-50-30 F and 9 VAC 5-80-1180 D)

5. The volatile organic compound throughput for the Allied Metals paint application fan coater spray systems (Coating Lines 1 thru 6), solvent-based coating lines 7 and 8 and the roll applicator print machines (1-12) shall not exceed 205.49 tons per year, as a combined total, calculated monthly as the sum of each consecutive 12 month period.

(9 VAC 5-80-1180 D)

6. The particulate matter throughput for the Allied Metals paint application fan coater spray systems (Coating Lines 1 thru 6), the solvent-based coating lines 7 and 8, and Roll Coaters (1-12) shall not exceed 298.32 tons per year, as a combined total, calculated monthly as the sum of each consecutive 12 month period.

(9 VAC 5-80-1180 D)

9. Emissions from the operation of the Allied Metals paint application fan coater spray systems (Coating Lines 1 thru 6), solvent-based coating lines 7 and 8, and the roll applicator print machines (1-12), as a combined total, shall not exceed the limits specified below:

Particulate Matter	28.59 lb/hr	24.85 tons/yr
PM-10	28.59 lb/hr	24.85 tons/yr
Volatile Organic Compounds	61.10 lb/hr	205.49 tons/yr

These emissions are derived from the estimated overall emission contribution from

operating limits. Exceedance of the operating limits shall be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 3, 5 and 6.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

12. Visible emissions from each Allied Metals paint application fan coater spray system exhaust shall not exceed five (5) percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A).
(9 VAC 5-80-1180, 9 VAC 5-50-20 and 9 VAC 5-50-260)

13. Visible emissions from solvent-based Coating Lines 7 and 8 shall not exceed five (5) percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.
(9 VAC 5-80-1180, 9 VAC 5-50-20 and 9 VAC 5-50-260)

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-50-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 30%. (Coating Lines 3-6)

As an existing General Use Plastic Parts and Products coating source, 9 VAC 5-60-100, Subpart PPPP of Virginia air pollution regulations and the following provisions of 40 CFR Part 63, Subpart PPPP-National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products (Table 2), apply to Coating Lines 1-6, Solvent-based Coating Lines 7 and 8, and Roll Application Print Machines 1-12:

40 CFR 63.4490(b)(1): Hazardous air pollutant (HAP) emissions not to exceed 0.16 pound HAP per pound coating solids;

40 CFR 63.4491: Compliance options;

40 CFR 63.4492(a): No operating limits are required for the Compliant Material option or the Emission Rate Without Add-on Controls option;

40 CFR 63.4493(a): No work practice standards are required for the Compliant Material option or the Emission Rate Without Add-on Controls option; and

40 CFR 63.4500(a)(1): General compliance requirements.

Monitoring

The permit contains a requirement for weekly visual observations on the exhaust of each paint application fan coater spray system. If visible emissions are present during any of the observations, a six-minute visible emission evaluation (VEE) must be performed in accordance with 40 CFR 60, Appendix A, Method 9. If the six-minute average opacity exceeds the permitted opacity limit, the Method 9 evaluation shall be immediately continued for a total evaluation time of 18 minutes or procedures to correct the visible emission condition shall be taken immediately. The corrective action shall be followed by a six-minute VEE in accordance with Method 9 to confirm compliance or 18 minutes if the opacity continues to be greater than the permitted opacity limit. This will satisfy the periodic monitoring requirement for the visible emission limitation included in the permit.

9 VAC 5-60-100, Subpart PPPP of Virginia air pollution regulations and the following provisions of 40 CFR Part 63, Subpart PPPP-National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products, apply to Coating Lines 1-6, Solvent-based Coating Lines 7 and 8, and Roll Application Print Machines 1-12:

40 CFR 63.4542: Continuous compliance requirements for the Compliant Material option; or

40 CFR 63.4552: Continuous compliance requirements for the Emission Rate Without Add-on Controls option.

Recordkeeping

Facility recordkeeping requirements are included below from condition 14 of the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

14. The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Director, Southwest Regional Office. These records shall include, but are not limited to:

- A monthly and annual material balance for the combined usage from the Allied Metals paint application fan coater spray systems (Coating Lines 1 thru 6), solvent coating lines 7 and 8 and roll application print machines (1-12), including the throughput and emissions of VOC and particulate matter/PM-10. Annual throughput and emissions shall be calculated monthly as the sum of each consecutive 12 month period.

- Material Safety Data Sheets (MSDS) or other vendor information showing VOC and solids content for each raw material, solvent, cleaner, or other formulations used in process operations at the facility.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five (5) years.

(9 VAC 5-50-50)

The permit includes requirements for maintaining records of equipment malfunctions which could cause violations of the Title V permit, and operating procedures, maintenance schedules, and service records for all air pollution-related equipment. Required records for the visible emissions checks include the date, time, name of the emission unit, the applicable visible emissions requirement, the results of the observation, and the name of the observer.

Testing

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard. The following requirement is contained in the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

3. The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Test ports shall be provided at the appropriate locations.

(9 VAC 5-50-30 F)

Reporting

9 VAC 5-60-100, Subpart PPPP of Virginia air pollution regulations and the following provisions of 40 CFR Part 63, Subpart PPPP-National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products, are applicable:

40 CFR 63.4510 and 4520: Notification and reporting requirements.

The initial compliance report required by 40 CFR 63.4510(c) was received by DEQ on August 4, 2008. The semiannual compliance reporting of 40 CFR 63.4520(a) applies.

General Title V reporting requirements include the semiannual reporting and annual compliance

certification requirements specified in the general conditions section of the permit.

EMISSION UNIT APPLICABLE REQUIREMENTS – Glaze Line (GL)

Limitations

The Glaze Line has been shut down permanently. Only general visible emissions requirements for new sources have been retained, as noted below.

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-50-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 30%. (Glaze line)

Monitoring

The permit contains a requirement for visual observations on the exhaust of the Glaze Line once each calendar week, only if the units are operated and an application for modification of this permit has been submitted to DEQ for such action. If visible emissions are present during any of the observations, a six-minute visible emission evaluation (VEE) must be performed in accordance with 40 CFR 60, Appendix A, Method 9. If the six-minute average opacity exceeds the permitted opacity limit, the Method 9 evaluation shall be immediately continued for a total evaluation time of 18 minutes or procedures to correct the visible emission condition shall be taken immediately. The corrective action shall be followed by a six-minute VEE in accordance with Method 9 to confirm compliance or 18 minutes if the opacity continues to be greater than 20%. This will satisfy the periodic monitoring requirement for the visible emission limitation included in the permit.

Recordkeeping

An application for a modification of this permit must be submitted to DEQ before units may operate. Facility recordkeeping requirements are included below from condition 14 of the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

14. The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content of and format of such records shall be arranged with the Director, Southwest Regional Office. These records shall include, but are not limited to:

- Material Safety Data Sheets (MSDS) or other vendor information showing VOC and solids content for each raw material, solvent, cleaner, or other formulations used in process operations at the facility.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five (5) years.

(9 VAC 5-50-50)

Testing

The permit does not require source tests. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard. The following requirement is contained in the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

3. The permitted facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Test ports shall be provided at the appropriate locations.

(9 VAC 5-50-30 F)

Reporting

There are no specific reporting requirements for the Glaze Line, other than the semiannual reporting and annual compliance certification requirements specified in the general conditions section of the permit.

EMISSION UNIT APPLICABLE REQUIREMENTS – Storage Silos 1-6 (SS 1-6)

Limitations

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-40-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 60%. (SS 1-4)

9 VAC 5-50-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 30%. (SS 5-6)

9 VAC 5-40-260, Standard for Particulate Matter – Process Weight Rate Table

Emissions from general processes are not to exceed corresponding quantities given by the formula, $E = (4.10)P^{0.67}$. The process weight rate for the storage silos is given as 5.35 tons/hr in the application for reissuance of the Title V permit. Accordingly, the maximum allowed particulate emission rate is given by:

$$E = (4.10)(5.35)^{0.67} = 12.61 \text{ lb/hr}$$

Monitoring

Visible emissions checks shall be performed weekly on the storage silos, during loading and unloading, for periods of normal daily operations. If visible emissions occur, Royal Mouldings will perform a six-minute VEE in accordance with Method 9 (40 CFR 60, Appendix A). If the six-minute average opacity exceeds the permitted opacity limit, the Method 9 evaluation shall be immediately continued for a total evaluation time of 18 minutes or procedures to correct the visible emission condition shall be taken immediately.

The particulate matter emission limit will be evaluated on the basis of process throughputs, emissions calculations and monthly recordkeeping, with annual emissions and throughputs calculated as the sum of each consecutive 12 month period. The application for the current Title V permit notes the applicability of the AP-42 emission factors for talc processing to the fines loading and unloading associated with the storage silo and extrusion operations. The emission factor (uncontrolled) for ground talc storage bin loading of 0.3168 lb/ton, coupled with a control efficiency of 99% for baghouse control with the four PVC silos and two styrene silos. The aggregate rated capacity of the silos is 5.346 tons/hr (input and output). Emissions for the storage silos will be calculated as follows:

$$\begin{aligned} (\text{PM emissions in lb/yr}) &= (2/3)(5.35 \text{ tons/hr})(7480 \text{ hr/yr})(0.3168 \text{ lb/ton})(1-0.99) \quad (\text{PVC silos}) \\ (\text{PM emissions in lb/yr}) &= 84.5 \text{ lb/yr} \quad (\text{PVC silos}) \end{aligned}$$

$$\begin{aligned} (\text{PM emissions in lb/yr}) &= (1/3)(5.35 \text{ tons/hr})(7480 \text{ hr/yr})(0.3168 \text{ lb/ton})(1 - 0.99) \quad (\text{Styrene silos}) \\ (\text{PM emissions in lb/yr}) &= 42.3 \text{ lb/yr} \quad (\text{Styrene silos}) \end{aligned}$$

Hourly emissions can be calculated by dividing the annual emissions by the hours of operation for the same 12 month period. Worst-case emissions are calculated below using maximum capacities for annual operation for 7480 hours per year:

$$\begin{aligned} \text{Worst case annual PM emissions} &= 84.5 \text{ lb} + 42.3 \text{ lb} = 126.8 \text{ lb} \\ (126.8 \text{ lb/yr}) / (7480 \text{ hours/yr}) &= 0.02 \text{ lb/hr} \end{aligned}$$

The resulting lb/hr value is below the 12.61 lb/hr limit.

Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include results of visible emissions checks and emission calculations.

Testing

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

There are no specific reporting requirements for the extrusion operations, other than the semiannual reporting and annual compliance certification requirements specified in the general conditions section of the permit.

EMISSION UNIT APPLICABLE REQUIREMENTS – Extrusion (Total)

Limitations

Royal Mouldings has added 24 PVC extruders since the issuance of the original Title V permit. These were determined to be exempt from NSR permitting. The company requested limits on extrusion operations in the February 2005 NSR permit, in order to avoid PSD implications, while also gaining flexibility in the use of individual extruders. Accordingly, annual throughput and emissions limits were established for the extrusion of PVC and for the extrusion of polystyrene.

Facility limitations from the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009)

4. Fugitive emission controls shall include the following, or equivalent, as a minimum:

Volatile organic compounds shall not be intentionally spilled, discarded to sewers, stored in open containers, or handled in any other manner that would result in evaporation beyond that consistent with air pollution control practices for minimizing emissions.

(9 VAC 5-50-260, 9 VAC 5-50-20, and 9 VAC 5-50-90)

7. The throughput of polyvinyl chloride (PVC) to the extrusion operations shall not

exceed 95,000,000 pounds per year, calculated monthly as the sum of each consecutive 12 month period.

(9 VAC 5-80-1180 D)

8. The throughput of polystyrene to the extrusion operations shall not exceed 15,000,000 pounds per year, calculated monthly as the sum of each consecutive 12 month period.

(9 VAC 5-80-1180 D)

10. Emissions from the operation of the PVC extrusion operations, as a combined total, shall not exceed the limits specified below:

Particulate Matter	3.01 tons/yr
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PM-10	3.01 tons/yr
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Volatile Organic Compounds	2.80 tons/yr
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These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits shall be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Condition 7.

(9 VAC 5-80-1180 C)

11. Emissions from the operation of the polystyrene extrusion operations, as a combined total, shall not exceed the limits specified below:

Particulate Matter	0.48 tons/yr
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PM-10	0.48 tons/yr
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Volatile Organic Compounds	33.3 tons/yr
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These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits shall be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Condition 8.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

The following Virginia Administrative Codes that have specific emission requirements have also been determined to be applicable:

9 VAC 5-50-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 30%.

9 VAC 5-40-260, Standard for Particulate Matter – Process Weight Rate Table
Emissions from general processes are not to exceed corresponding quantities given by the formula, $E = (4.10)P^{0.67}$. The process weight rate for the total extrusion process was calculated as an aggregate capacity of 7.88 tons/hr in the original Title V permit. The 24 new extruders add 1.59 tons/hr to the process weight rate total. This yields a process rate of 9.47 tons/hr for the total extrusion process. Accordingly, the maximum allowed particulate emission rate is given by:

$$E = (4.10)(9.47)^{0.67} = 18.49 \text{ lb/hr}$$

Monitoring

Visible emissions checks shall be performed weekly on the 8 exhaust stacks for the total extrusion process during periods of normal daily operations. The new extruders discharge from stacks 1 through 6 (EXS 1-6) for the PVC extrusion process. If visible emissions occur, Royal Mouldings will perform a six-minute VEE in accordance with Method 9 (40 CFR 60, Appendix A). If the six-minute average opacity exceeds the permitted opacity limit, the Method 9 evaluation shall be immediately continued for a total evaluation time of 18 minutes or procedures to correct the visible emission condition shall be taken immediately.

The hourly and annual particulate matter emission limits will be evaluated on the basis of process throughputs, emissions calculations and monthly recordkeeping, with annual emissions and throughputs calculated as the sum of each consecutive 12 month period. Royal Moulding's original Title V application notes the applicability of the AP-42 emission factors for talc processing to the fines loading and unloading associated with the extrusion (and storage silo) operations. The uncontrolled emission factor for ground talc storage bin loading of 0.3168 lb/ton (accounting for 99% control for a fabric filter with the controlled emission factor) from Table 11.26.1 will be used, together with a 60% capture efficiency for the Main Plant building enclosure.

$$(\text{PM emissions in lb/yr}) = (\text{total annual throughput in tons}) \times (0.3168 \text{ lb/ton}) \times (1-0.6)$$

Hourly emissions can be calculated by dividing the annual emissions by the hours of operation for the same 12 month period. Worst-case annual emissions are calculated below using the

annual throughput limits for PVC and polystyrene of 47,500 tons per year for PVC and 7,500 tons per year for polystyrene:

PVC – $(47,500 \text{ tons/yr})(0.3168 \text{ lb/ton})(1 - 0.6)/(2000 \text{ lb/ton}) = 3.00 \text{ tons/yr}$

Polystyrene – $(7,500 \text{ tons/yr})(0.3168 \text{ lb/ton})(1 - 0.6)/(2000 \text{ lb/ton}) = 0.48 \text{ tons/yr}$

Worst-case total PM annual emissions = $3.00 \text{ tons/yr} + 0.48 \text{ tons/yr} = 3.48 \text{ tons/yr}$

Maximum annual hours of operation for extrusion are noted as 7,480 hours per year.

$(3.48 \text{ tons/yr})(2000 \text{ lb/ton})/(7480 \text{ hr/yr}) = 0.93 \text{ lb/hr}$

The resulting lb/hr value is below the 18.49 lb/hr limit.

Calculations of hourly and annual emissions of VOC shall make use of an emission factor of 59 lb of VOC per million pounds of PVC processed (from the 1996 vinyl pipe study), and a factor of 4,440 lb of VOC per million pounds of polystyrene processed (from “VOC Emission of Polymer Resins” by Polymer Solutions Incorporated). Hourly emissions can be calculated by dividing the annual emissions by the hours of operation for the same 12 month period.

Recordkeeping

Facility recordkeeping requirements are included below from condition 14 of the NSR permit issued February 9, 2005 (as amended August 29, 2006 and April 29, 2009).

14. The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content of and format of such records shall be arranged with the Director, Southwest Regional Office. These records shall include, but are not limited to:

- Material Safety Data Sheets (MSDS) or other vendor information showing VOC and solids content for each raw material, solvent, cleaner, or other formulations used in process operations at the facility.
- Monthly and annual throughput in pounds of PVC resin to the extrusion operations. Annual throughput shall be calculated monthly as the sum of each consecutive 12 month period.
- Monthly and annual throughput in pounds of polystyrene resin to the extrusion operations. Annual throughput shall be calculated monthly as the sum of each consecutive 12 month period.

These records shall be available on site for inspection by the DEQ and shall be current for

the most recent five (5) years.
(9 VAC 5-50-50)

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These include results of visible emissions checks and emission calculations.

Testing

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

There are no specific reporting requirements for the extrusion operations, other than the semiannual reporting and annual compliance certification requirements specified in the general conditions section of the permit.

EMISSION UNIT APPLICABLE REQUIREMENTS – Catalytic & Drying Ovens (CO1 - CO6)

Limitations

The following Virginia Administrative Codes that have specific emission requirements have been determined to be applicable:

9 VAC 5-50-80, Standard for Visible Emissions – 20% opacity except for one 6-minute period not to exceed 30%.

Monitoring

Visible emissions checks shall be performed weekly on the exhaust stacks for the catalytic and drying ovens, during periods of normal daily operations. If visible emissions occur, Royal Mouldings will perform a six-minute VEE in accordance with Method 9 (40 CFR 60, Appendix A). If the six-minute average opacity exceeds the permitted opacity limit, the Method 9 evaluation shall be immediately continued for a total evaluation time of 18 minutes or procedures to correct the visible emission condition shall be taken immediately.

Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include results of visible emissions checks and emission calculations.

Testing

The permit does not require source tests. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

There are no specific reporting requirements for the catalytic and drying ovens, other than the semiannual reporting and annual compliance certification requirements specified in the general conditions section of the permit.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal-operating permitted sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, and includes notification requirements for 40 CFR Part 63, Subpart PPPP - National Emission Standards for Surface Coating of Plastic Parts and Products.

Comments on General Conditions

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.2-604 and §10.1-1185 of the *Code of Virginia*, and the “Department of Environmental Quality Agency Policy Statement No. 2-2003”.

This general condition cites the Article that follows:

Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Operating Permits for Stationary Sources

This general condition cites the sections that follow:

9 VAC 5-80-80. Application

9 VAC 5-80-140. Permit Shield

9 VAC 5-80-150. Action on Permit Applications

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excesses emissions reporting within 4 hours of discovery. Section 9 VAC 5-80-250 of the Title V regulations also requires malfunction reporting; however, reporting is required within 2 days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to section 9 VAC 5-20-180 including Title V facilities. Section 9 VAC 5-80-250 is from the Title V regulations. Title V facilities are subject to both sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within 4 daytime business hours of discovery of the malfunction.

In order for emission units to be relieved from the requirement to make a written report in 14 days, the emission units must have continuous monitors meeting the requirements of 9 VAC 5-50-410 OR 9 VAC 5-40-41.

J. Permit Modification

This general condition cites the sections that follow:

9 VAC 5-80-50. Applicability, Federal Operating Permit For Stationary Sources

9 VAC 5-80-190. Changes to Permits

9 VAC 5-80-260. Enforcement

9 VAC 5-80-1100. Applicability, Permits for New and Modified Stationary Sources

9 VAC 5-80-1605. Applicability, Permits For Major Stationary Sources and Modifications
Locating in Prevention of Significant Deterioration Areas

9 VAC 5-80-2000. Applicability, Permits for Major Stationary Sources and Major Modifications
Locating in Nonattainment Areas

U. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in sections 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction

requirements are listed in General Condition U and General Condition F. For further explanation see the comments on General Condition F.

This general condition cites the sections that follow:

9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

9 VAC 5-80-110. Permit Content

FUTURE APPLICABLE REQUIREMENTS

Emission units CO1- CO6, and AO1 and AO2 (as identified in Section IX Insignificant Emission Units), will be subject to 40 CFR Part 63, Subpart DDDDD (Industrial/Commercial Institutional Boilers and Process Heater NESHAP (Boiler MACT)) when promulgated, unless the permittee obtains federally enforceable limits on its facility-wide emissions of hazardous air pollutants (HAPs) to below major-source thresholds prior to the first substantive compliance date of the Boiler MACT.

INAPPLICABLE REQUIREMENTS

Citation	Title of Citation	Description of Applicability
40 CFR Part 60, Section 60.40c	Subpart Dc – Stds. of Performance for Small Industrial-Commercial-Institutional Steam Generating Unit	Not applicable – Boilers constructed prior to June 9, 1989 are less than 10 MMBtu/hr heat capacity
40 CFR Part 60, Section 60.110b	Subpart Kb – Stds. of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced After July 23, 1984	Not applicable – Storage Tank #6 for Styrene Reducer was constructed prior to July 23, 1984
40 CFR Part 63, Section 63.468	Subpart QQQQ – National Emission Standards for Surface Coating of Wood Building Products	Not applicable – Use of coatings falls under Subpart PPPP, as 95% or more of coatings are for plastic parts.
40 CFR Part 63, Section 63.80	Subpart JJ – National Emission Standards for Wood Furniture Manufacturing Operations	Not applicable – Royal Mouldings does not produce wood furniture or furniture components

The startup, shutdown, and malfunction opacity exclusion listed in 9 VAC 5-40-20 A 3 cannot be included in any Title V permit. This portion of the regulation is not part of the federally

approved state implementation plan. The opacity standard applies to existing sources at all times including startup, shutdown, and malfunction. Opacity exceedances during startup and shutdown will be reviewed with enforcement discretion using the requirements of 9 VAC 5-40-20 E, which state that "At all times, including periods of startup, shutdown, soot blowing and malfunction, owners shall, to the extent practicable, maintain and operate any affected facility, including associated air pollution control equipment, in a manner consistent with air pollution control practices for minimizing emissions."

Compliance Assurance Monitoring (CAM) requirements do not apply to Coating lines 1 through 6 and the Glaze Line, even though these lines have particulate emissions limits and require the use of filters to meet the same. This is due to throughput limits, which restrict particulate emissions to below major source levels without the required controls.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation ¹ (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
MGS 1-18	18 Modine Gas Space Heaters	9 VAC 5-80-720 A.		
GSH 19-47	29 Prefinish Plant Space Heaters	9 VAC 5-80-720 A		
AO1 & AO2	Natural gas-fired annealing ovens			9 VAC 5-80-720 C
NGSH 1-7	7 new gas space heaters	9 VAC 5-80-720 A		
	Temporary soil vapor & liquid extraction & remediation system		9 VAC 5-80-720 B (0.04 tons/yr VOC)	

¹The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The draft permit was placed on public notice in the Smyth County News & Messenger on March 6, 2010, with a comment period through April 5, 2010. A copy of the public notice was provided to North Carolina, West Virginia and Tennessee as affected states. All persons on the Title V mailing list were sent a copy of the public notice by e-mail, fax or letter. The draft was transmitted for concurrent review by EPA. Comments were received from EPA by e-mail from Gerallyn Duke on April 1, 2010. No other comments were received during the public comment period. Listed below is a summary of the EPA comments and DEQ responses, (provided by e-mail to Gerallyn Duke on April 9, 2010):

EPA Comments on Draft/Proposed Title V Renewal For Royal Mouldings Limited

- 1. The Statement of Basis should address how emission limits for the PM, PM-10 and VOCs were derived for each unit.** In general, an SOB will not reconstruct each and every detail of emission calculations associated with an underlying NSR permit. The SOB and permit usually reference the underlying permit documentation or applicable requirement. From that, one can discern the basis for emission limitations by reviewing the original calculations or engineering analysis. SOB's normally indicate in illustrative terms the source of emission limits and their basic derivation. **The SOB does state in some sections that these are "derived from the estimated overall emission contribution from operating limits."** What does this mean? That statement originates from an underlying minor NSR permit. The intent of the wording is to clarify that the emission limits in the NSR permit were derived from and are directly related to a throughput rate, equipment rating, or other production constraint or restriction. This is common wording in our minor NSR permits. The connection between the "operating limit" and the emission limit is usually by means of an emission factor. **Were these values based on stack tests?** Emission limits can be based on a variety of sources. For

example, an AP42 emission factor calculation, material balance calculation, or emission test results can be used as a basis for emission factors. The documentation for the underlying permit confirms the basis of the emission limits. **The SOB should provide sufficient justification to explain why the PM and PM-10 limits are exactly the same.**

In most cases where PM and PM10 emission rates are identical, the limit will date back to a time when the underlying permit was created and there were no separate factors, so they were presumed equal. In some situations, identical limits originate from Virginia rules for general process operations, where only a TSP limit can be derived, so an equal PM10 limit is presumed.

2. **Stack testing is usually required at least once every 5 years. Why is this not a requirement for this facility?** We do require a source emission test during each five-year permit cycle for most of our facilities that have large pieces of fuel burning equipment, or that have operations with highly variable operating conditions. For a facility such as Royal, with consistent coating and extrusion operations, numerous emissions points, and where we have over 20 years of engineering information about processes, materials and operations, less frequent or no testing is warranted. Such is the case with this facility, which operates numerous pieces of extrusion and coating equipment that vary little in terms of design and operating specifications and whose emission characteristics are well established through material balance and other techniques.

Part III of the Permit, Process Equipment Requirements- Coating Lines 1 -6, Solvent-Based Coating Lines, and roll Applicator Print Machines

3. **Monitoring - The means of determining compliance with the VOC, PM and PM-10 caps does not appear to be set forth in the permit. Recordkeeping requirements include recording material balance, but no means of how these are measured each month is provided.** The material balance approach has long been relied upon for periodic monitoring in Title V permits for a variety of coating operations and its details are not usually established specifically in the underlying NSR permit. This particular facility uses a novel and proprietary software package to record and calculate emissions, which has been arranged through coordination with DEQ's air compliance section. Our minor NSR permits are normally written to provide this coordinated approach. The software system Royal uses for tracking is called REGMET and is more or less an industry standard in the wood furniture manufacturing sector and other coating industries. For this system, a source measures and records usage quantities of all coatings on a daily, weekly or monthly basis, and regularly enters the data into the software, which calculates and reports emissions, based on coating characteristics. **This is needed, along with a justification for the VOC, PM and PM-10 monitoring requirements in the Statement of Basis.** The justification for the monitoring and recordkeeping methods is directly related to DEQ air compliance personnel's application of the underlying minor NSR

permit conditions that address such, and the periodic monitoring requirements of the Title V permit. The justification could be discussed in the SOB, but in accordance with the NSR permit and the normal construct of a Virginia Title V permit, this is a matter of staff and source coordination. **Please include, in the permit, whether the PM-10- limits include filterable emissions only or must include the condensable fraction as well.** Fan and curtain coaters use high solids coatings, have limited atomization, and are controlled by filters. Condensable emissions are nil or minimal, since small natural gas combustion units, the extruders and roll applicators are the only other sources involved. Limited quantities of filterable particulate emissions are associated with loading the extruders. It is therefore presumed that all PM emissions would be filterable. A clarifying indicator could be added that would identify the emissions as filterable, but we consider such an indicator unnecessary.

4. **Condition #3 - Incorporation by reference of all requirements in 40 CFR Part 63.4480 through 63.4581 is not an acceptable means of determining compliance. See Premcor and Citgo petitions, attached. Only applicable requirements should be listed or cited. The permit should indicate which type of coating operations (general use, automotive lamp, TPO, etc.) occurs at this facility and which specific respective MACT requirements apply. Only requirements from the MACT should be included in the permit, and not sections of the MACT that address such issues as the purpose of the subpart, and general applicability criteria such as in Subpart 64. 4481. The MACT standards are for General Use Plastic Parts and Products from Table 2 of Subpart PPPP. This will be noted in the referenced condition #3 of the draft Title V permit, as part of your requested edit of this condition. We do note, though, that the general approach to incorporating the Subpart PPPP requirements follows that of the permit issued in April 2006 to the Strongwell Corporation – Bristol Division (SWRO10211), which also was the subject of EPA review. The referenced Premcor and Citgo petitions did not address the incorporation of MACT standards in Title V permits, and EPA’s responses to the petitions only agreed that emissions limits from underlying NSR permits or enforcement orders must be stated explicitly in the Title V permit. All such limits from underlying NSR permits have been incorporated in the draft Title V permit for Royal Mouldings Limited. EPA’s response to the Premcor petition concluded that incorporation by reference is appropriate where information is part of the public docket or is readily available.**

Part VI or the Permit, Process Equipment Requirements Extrusion (total)

5. **Short-term PM-10 and VOC limits are needed for the extrusion units. In order for emission limitations to be federally enforceable from the practical standpoint, they must be short tem and specific so as to enable the Agency to determine compliance at any time. Emission limitations on a yearly basis alone (e.g., tons per year or rolling yearly averages) do not satisfy EPA’s requirement with respect to federal**

enforceability. See *Clarification of New Source Review Policy on Averaging Times for Production Limitations* at

<http://www.epa.gov/region7/air/nsr/nsrmemos/avetimes.pdf>. Limitations for the process in question were established in an underlying NSR permit many years ago. The permit was established for the joint purposes of fulfilling the state's minor NSR requirements and "capping" the operation's emissions for purposes of major source modification avoidance. At the time the underlying NSR permit was issued, the approach taken was valid for both purposes. The change suggested in the comment would require a revision to the underlying NSR permit. This issue had apparently been acceptable to EPA previously and it is our position that the limits are acceptable and that "creating" new applicable requirements in the Title V permit would be inappropriate.

Ms. Duke indicated that the DEQ responses and proposed action were acceptable in a telephone conversation with Mike Gregory, the permit writer, on April 21, 2010. She also indicated that EPA does not require repeated public notice procedures in the resolution of EPA comments of the nature provided for the draft of this permit.